

Abundance Ratios in Dwarf Elliptical Galaxies

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Abstract. The aim of this study is to determine abundance ratios and star formation histories (SFH) of dwarf ellipticals in the nearby Virgo cluster. We perform a stellar population analysis of 39 dEs and study them using index-index and scaling relations. We find an unusual behaviour where $[\text{Na}/\text{Fe}]$ is under-abundant w.r.t. solar while $[\text{Ca}/\text{Fe}]$ is over-abundant.

Keywords. galaxies: dwarf elliptical, stellar populations, abundance ratios, individual (Virgo)

1. Sample

Our sample comprises 39 dEs as part of SMACKED project (Toloba *et al.* 2014, Janz *et al.* 2014). We measured 24 Lick-indices (Worthey 1994) in the LIS-5 Å system (Vazdekis *et al.* 2010). The luminosity-weighted ages and metallicities are estimated using age-sensitive and metallicity-sensitive Lick indices. We calculated $[\text{Na}/\text{Fe}]$ from NaD and $[\text{Ca}/\text{Fe}]$ from Ca4227 using the Conroy & van Dokkum (2012) models.

2. Conclusion

Using Lick indices, we have derived ages, metallicities and elemental abundance ratios for 39 dwarf elliptical galaxies in the Virgo cluster. As a remarkable result we found that our sample of dEs are under-abundant in Na and over-abundant in Ca when compared to the Local Group. SN yields for odd-Z elements have strong dependence on metallicity. Slow chemical enrichment in SNIa could explain the Na under-abundance in low metallicity dwarfs and relatively low Ca abundance. This means that dEs have disk-like SFH favouring them to originate from star-forming dwarfs.

References

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